

**Maternal knowledge, attitudes and practices concerning child health among  
mothers of children younger than 60 months in Kep District, Kingdom of  
Cambodia**

FINAL REPORT  
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## ABSTRACT

After years of widespread turmoil and the annihilation of one quarter of its population following the rule of Pol Pot, Cambodia was left with an appalling health care system. Despite initial rebuilding efforts, Cambodia's health parameters remain amongst the lowest in South East Asia. Child mortality rates are terrible and many deaths are due to totally preventable childhood illnesses. Local government efforts to ameliorate the health status of Cambodians continue to be insufficient. A pressing need for international aid with a particular emphasis on maternal-child health exists.

**PURPOSE:** To assess the child health-related knowledge, attitudes and practices (KAP) of mothers of children less than 60 months of age in Kep, Cambodia. **METHODS:** Semi-structured surveys were conducted on 200 Khmer women with children less than 60 months of age. Interviews took place at the villagers' homes and lasted 30 minutes. Questions about knowledge of various health issues focused on etiology, signs and symptoms of illness, and treatment of common childhood illnesses. Practice questions were directed at treatment of the child and health-seeking behaviours of mothers when their child is ill as well as prophylactic measures taken by the mother for the child. **RESULTS:** Survey findings indicated that maternal KAP of common childhood illnesses is deficient. Antenatal care for mothers as well as vaccination rates and nutritional status of children are unacceptably poor. Less than one-quarter of those interviewed used the public health care system for their child's last episode of diarrhea, worms or acute respiratory infection.

**CONCLUSIONS:** Maternal child health-related KAP is insufficient and urgent intervention is required to implement local educational programs for women of child-bearing age. Education must include topics such as immunizations, sanitation, and treatment of diarrhea, acute respiratory infections and worms. Most importantly, infant and child nutrition programs must be put into place.

## 1.0 INTRODUCTION

### 1.1 The Current Status of Child Health Care in Cambodia

Following the years of civil unrest and genocide, Cambodia was left with huge socioeconomic difficulties, including health parameters that ranked among the lowest in Southeast Asia. Attempting to rebuild itself, the Cambodian government has sought to develop a better and sustainable health care system. Starting in 1989, in conjunction with the World Health Organization (WHO) and the United Nations, formal planning of a suitable health care policy began<sup>1</sup>. This led to the incorporation in 1995 of the Committee on Primary Health Care specifically charged with improving community health.<sup>2</sup> The result of these preliminary efforts is The Health Sector Strategic Plan 2003-2007 which details the government's goals and objectives. In particular, three problem areas were identified as priorities. These include: 1) the rise in infant and child mortality from potentially preventable obstetrical and infectious causes 2) widespread malnutrition and 3) harmful behaviours and unhealthy lifestyle practices.<sup>3</sup>

Despite these planning initiatives, health conditions remain abysmal for most Cambodians. Life expectancy is only 54 years.<sup>4</sup> Child mortality rates are appalling. 149 males per thousand and 124 per thousand females die before their fifth birthday.<sup>5</sup> The common reported causes of infant and child mortality include neonatal tetanus, acute respiratory tract infections (ARIs), diarrhea, meningitis, septicemia, typhoid, malaria and dengue.<sup>6</sup> Many of the causes of childhood morbidity and mortality are preventable. Unfortunately, the ability of the local government to address these problems is tremendously inadequate. The need to deliver child health interventions remains urgent and this cannot be done in a timely fashion without the aid of NGOs and other donors.

### 1.2 Research Objectives

The purpose of this study is **to assess the child health-related knowledge, attitudes and practices (KAP) of mothers of children less than 60 months of age in Kep, Cambodia.** To date, few studies have been conducted to assess the maternal child health-related KAP in Cambodia. This research project, therefore, is one of the first studies on the subject of child health at the village level.

Specifically, the study will survey maternal KAP regarding breastfeeding, infant feeding and nutrition, diarrheal disease, respiratory illness, maternal care, immunizations including drop-out rates between series antigens, use of vitamin A-rich foods and de-worming procedures. The findings of this study will be used for the planning and implementation of educational and behavioral interventions to improve child health care of the area by the Kep Public Health District of the Ministry of Health (MoH) and the Centre for International Health (CIH) at the University of Toronto. Also, in collecting baseline information, one can evaluate future community-based or health centre-based programs on a year-over-year basis that may be implemented.

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<sup>1</sup> National Policy on Primary Health Care, Cambodian Ministry of Health, 2000

<sup>2</sup> National Policy on Primary Health Care, Cambodian Ministry of Health, 2002

<sup>3</sup> Health Sector Strategic Plan 2003 – 2007, Cambodian Ministry of Health, August 2002

<sup>4</sup> World Health Organization, 2002

<sup>5</sup> *ibid.*

<sup>6</sup> USAID Annual Report, 2003

## 2.0 METHODS:

### 2.1 Research Site: Kep District

Kep is a municipality and province in the southwest of Cambodia, a three hour drive from Phnom Penh. Kep is a rural area with a population of 35, 434.<sup>7</sup> In Kep, there are currently five communes each made up of several villages, totalling 16 in the area. The primary occupations of those living in the area are subsistence farmers or fishermen. Most of the population of Kep lives without electricity and basic public health facilities to provide clean water and safe sewage disposal.

Currently serving the area is one referral hospital and three community health centres in the communes of Okrasa, Pong Tuk and Angkoul of which serve populations of 5,901, 7,886 and 6,972 people, respectively.<sup>8</sup> The health care offered by these centres is under the supervision of the Operational District Office and the MoH. The staff at these health centres are generally poorly paid and trained. There is also competition between the public health services offered in Kep and private health care practitioners who consist of traditional birth attendants, traditional healers, pharmacists and health care workers operating privately.<sup>9</sup>

Kep is ideal for the research study because it is one of the sites chosen by the University of Toronto Centre for International Health for implementing their project looking at the “development of a Primary Health Care (PHC) model for under-resourced settings”.<sup>10</sup>

### 2.2 Study Design: A Semi-Structured Survey

This study was conducted as a semi-structured survey with a total of 63 questions. The first set of questions asked about demographics, followed by a set of questions about breastfeeding and nutrition knowledge and practices. The next set focused on diarrheal disease and the child followed by questions pertaining to respiratory illnesses and the child. Questions then pertained to childhood immunizations, prenatal care and worms and the child. Lastly, the child was measured for height, weight, and head circumference. Questions were adapted from a previous survey on maternal KAP concerning common childhood illnesses by Partners for Development in the Chhlong Operational District, Kratie Province<sup>11</sup> and questions were added or modified to reflect the goals and objectives of the current project.

The questionnaire was designed to ask questions of mothers of children under 60 months of age and was translated into Khmer. Questions about knowledge of the various health issues focused on etiology, sources of information about the illness, risk factors, signs and symptoms of illness, treatment, where and how to obtain health care. Questions about maternal attitude centred on feelings towards the illness, treatment and health care services offered. Practice questions were directed at treatment and health-seeking behaviours of mothers when their child is ill as well as prophylactic measures taken by the mother for the child (immunizations, etc.).

### 2.3 Selection Criteria and Sampling

Only women of with at least one child aged less than 60 months were eligible for interview. All information pertaining to maternal practices concerning child health were taken in reference to the youngest child only. The interview took place only after informed consent was given. A convenience sample of 200 women was taken. Twenty women from ten randomly selected villages served by the Ankoul, Pong Tuk and Okrasa health centres were interviewed to maximize regional representation.

### 2.4 Data Collection and Analysis

Field research was conducted over a six week period in June and July 2005, during the Cambodian rainy season. All interviews were conducted by the researcher and a Khmer translator. Each of the 200 women interviewed gave informed consent and all data were included for analysis.

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<sup>7</sup> Ministry of Health National Statistics, 2003

<sup>8</sup> Skalenda, P, 2004.

<sup>9</sup> *ibid.*

<sup>10</sup> Centre for International Health Webpage, 2004.

<sup>11</sup> Partners for Development, 1999

Data from the interviews were translated from Khmer to English by the translator and were recorded in English on individual copies of the questionnaire. All data entry and analyses were carried out using Microsoft Excel.

### 3.0 RESULTS:

#### 3.1 Identifying Data

Two hundred interviews were conducted in a total of 10 villages in Kep Province. Demographic information from the interviews is summarized in Table 1.

Table 1. Demographics		
Mean	Maternal Age (years $\pm$ SD)	
	28.67 $\pm$ 6.57	
Mean	Number of Children per Mother	
	2.8 $\pm$ 1.8	
	Education	
	Total Number	Percentage of Total
Never attended school	50	25.0
Primary does not read	43	21.5
Primary reads	97	48.5
Secondary	10	5.0
Post-secondary	0	0.0
	Occupation	
	Total Number	Percentage of Total
Unemployed	80	40.0
Handicrafts	5	2.5
Farmer	100	50.0
Street Vendor	12	6.0
Shop Keeper	5	2.5
Salaried Worker	0	0.0
Other	1	0.5
	Child Care	
	Total Number	Percentage of Total
Self	43	21.5
Husband	11	5.5
Older Children	52	26.0
Grandmother	91	45.5
Grandfather	7	3.5
Aunt	11	5.5
Neighbours	0	0.0
Other	1	0.5

The mean age of the mothers interviewed was 28.7 years and each had a mean of 2.8 children. The educational status of the women interviewed was low with 46.5 % being illiterate. Literacy was defined as the ability to read a simple sentence in Khmer. Only ten women interviewed (5.0 %) had ever attended secondary school. The primary occupation of the mothers was either a farmer (50.0 %) or they were unemployed (40.0 %). None of the mother's interviewed held salaried positions for employment.

#### 3.2 Fertility and Prenatal Care

Of all the mothers surveyed (n = 200), 73.5 % were not currently using any form of contraception. 12.0% of mothers reported using oral contraceptives in the form of a pill, 11.5 % report receiving injections for contraception, 2.5 % of partners had had a vasectomy and 0.5 % used condoms for contraception. Of all those interviewed, only 22.5 % desired having a child within the next two years and 11.5 % of all interviewees knew they were pregnant at the time of the interview.

Mothers were asked to show their white maternal health book where prenatal information is recorded. While 49.5% of mothers reported having made a prenatal visit to a health care facility, only 11.0 % had a maternal health book demonstrating they had made at least one prenatal visit and 26.5 % said they had lost their book. 62.5% of mothers reported never having had one.

Mothers were asked to recall how the volume of food they ate during their pregnancy changed. Only 42.5 % of mothers reported having eaten more during their pregnancy while 25.5 % ate the same amount and 31.0 % ate less. 1.0% of mothers could not recall how their eating volume changed during pregnancy.

The pink tetanus vaccination cards given to mothers during pregnancy were looked at to gather information about the tetanus vaccination coverage of the mothers. Almost half (49 %) of mothers had never received any tetanus injections and did not have cards, 32 % said that they had lost their cards but claimed to have received at least one injection. 5.0 % of mothers could demonstrate by their cards that they had received one tetanus injection and 14 % of mothers could demonstrate that they had received two or more injections.

To determine their knowledge of the importance of the tetanus vaccination in the pregnant mother, mothers were asked for whom was the benefit of the tetanus injections during pregnancy. Table 2 shows the results this and Table 3 shows the results for what mothers believe are the correct number of tetanus vaccination injections required for full immunity during pregnancy.

<b>Table 2. Knowledge of Tetanus Function</b>	
<b>To Protect...</b>	<b>Percentage of Children (%) (n = 200)</b>
The Mother and Newborn	21.5
The Mother Only	3.0
The Newborn Only	31.5
Doesn't know	44.0

<b>Table 3. Knowledge of Number of Tetanus Injections Required by Pregnant Mothers</b>	
<b>Number of Shots</b>	<b>Percentage of Children (%) (n = 200)</b>
One	8.5
Two	14.0
More Than Two	55.5
None	1.0
Doesn't Know	21.0

### 3.3 Vaccination Coverage

Of all of the mothers surveyed (n = 200), 80.5 % claimed that their child had received at least one vaccination, however, only 51.5% of mothers were able to produced a yellow vaccination card to verify that their child had in fact received any vaccinations. 19.5% of mothers reported that their child had never received any vaccinations or yellow vaccination cards.

The World Health Organization recommends that children receive vaccinations for 6 vaccine-preventable diseases, including tuberculosis, diphtheria, whooping cough, tetanus, polio, and measles. Table 4 shows information collected on vaccination coverage for these diseases for all children aged 12 months and older who were interviewed. Children are considered fully vaccinated when they have received the following: 1 time against tuberculosis, 3 doses each of DPT and polio vaccines and a measles vaccination. All of these should be completed by the age of 12 months. Data was taken from vaccination cards where available and when not available, data were recorded as such.

<b>Table 4. Vaccination coverage for children 12-59 months in Kep, Cambodia</b>		
<b>Vaccination</b>	<b>Total Number Covered</b>	<b>Percentage Covered (%)</b>
BCG	40	34.5
DPT 1	38	32.8
DPT 2	34	29.3
DPT 3	30	25.9
Polio 1	38	32.8
Polio 2	34	29.3
Polio 3	31	26.7
Measles	25	21.6
All Vaccinations	21	18.1
No Vaccinations	5	4.3
N/A	67	57.8

Table 5 shows the primary reasons cited as to why the child (0-59 months) has not received any vaccinations.

<b>Table 5. Reasons Cited For Why Child Has Not Received Any Vaccinations</b>		
<b>Reason</b>	<b>Number of Respondents</b>	<b>Percentage of Respondents (%)</b>
Mother doesn't want baby to get a fever	9	23.1
The doctor never came to house or village	7	17.9
Did not know child needed to be vaccinated	6	15.4



Baby/Mom afraid of injections	3	7.7
Mother thinks baby is too young	6	15.4
Too busy	1	2.6
Mother thinks doctor not qualified	1	2.6
Conflict with a holiday	1	2.6
Other	5	12.8

### 3.4 Prevalence and Treatment of Diarrhea

In response to the survey, 14.5% of all children (n = 200) under 60 months had experienced diarrhea in the two weeks before the survey. The diarrhea lasted an average of  $3.5 \pm 2.2$  days. When asked to report the number of episodes of diarrhea experienced by the child in the last 12 months for children 12 – 60 months, mothers reported an average of  $4.5 \pm 6.7$  episodes of diarrhea.

Table 6 shows the changes in amount of breast milk given to the child during the episode of diarrhea. 58.6 % of mothers reported giving their child the same amount of breast milk as usual and only 13.8 % reported giving their child more breast milk.

Table 6. Breastfeeding Practices During Diarrheal Episode in Last Two Weeks	
Breastfeeding	Percentage of Children (%) (n = 29)
More than usual	13.8
Same as usual	58.6
Less than usual	6.9
Stopped breastfeeding	0.0
Child is not being breastfed	20.7

Table 7 shows the changes in the amount of fluids, other than breast milk given to the child during the episode of diarrhea. Only 24.1% of mothers reported giving their child more fluid to drink during the diarrhea and 13.8% gave their child less to drink during this time.

Table 7. Drinking Practices During Diarrheal Episode in Last Two Weeks	
Amount of Fluid	Percentage of Children (%) (n = 29)
More than usual	24.1
Same as usual	37.9
Less than usual	13.8
Stopped giving fluids	0.0
Child is breastfed exclusively	24.1

Table 8 shows the treatment given to the child during the episode of diarrhea. When the child had diarrhea in the two weeks preceding the survey, 31.0 % of mothers reported doing nothing to treat their child's diarrhea and 58.6 % reported giving their child what they considered anti-diarrheal medicine.

Table 8. Diarrhea Treatment	
Treatment	Percentage of Children (%) (n = 29)
Nothing	31.0
Oral rehydration salts	0.0
Sugar-salt solution	0.0
Rice Soup	3.4
Home Fluids (tea, etc.)	6.9
Anti-diarrheal medicine	58.6
Other	17.2

Table 9 shows from whom treatment was sought during the child's episode of diarrhea. Reasons for not seeking treatment included that the baby was too young (2 mothers), that the mother did not know she should seek treatment (3 mothers), and that the diarrhea was not severe enough to seek treatment (3 mothers).

Table 9. Treatment Sought for Diarrhea	
Treatment	Percentage of Children (%) (n = 29)
Public Medical	24.1
Private Medical	48.3
Non-Medical (e.g. traditional healer)	0.0
Total Seeking Treatment	72.4

Table 10 shows the responses of mothers demonstrating their ability to recognize when they should seek medical treatment based on associated signs and symptoms of diarrhea. Mothers primarily identified fever (81.5%) as an important sign for which to seek treatment, followed by vomiting (37.0 %) and blood in the child's stool (35.0%).

Table 10. Recognition of Sign/Symptoms of Diarrhea Needing Treatment	
Sign/Symptom	Percentage of Responses (%) (n = 200)
Doesn't know	12.0
Vomiting	37.0
Fever	81.5
Dehydration	25.5
Diarrhea lasting more than 3 days	6.5
Blood in stool	35.0
Loss of appetite	19.0
Weakness	2.5
Mucus in Diarrhea	5.0
Quiet Baby	9.5
Other	5.0

Table 11 shows the responses for what actions mothers believe are important when their child has diarrhea. Almost half (46.5%) of mothers believe they should take their child to a health facility (health centre or hospital) and almost half (49.5%) believe they should give their child medicine for the diarrhea. Only 22.0% reported giving their child more to drink was an important action to be taken when their child gets diarrhea.

Table 11. Actions to be Taken During Child's Diarrhea	
Action	Percentage of Responses (%) (n = 200)
Doesn't know	3.0
Initiate fluids rapidly	1.0
Give the child more to drink	22.0
Smaller, more frequent feeds	6.5
Oral Rehydration Therapy	1.5
Take Child to Health Facility	46.5
Feed more to regain weight	4.0
Withhold fluids	0.0
Withhold foods	0.5
Give Medicine for the diarrhea	49.5
Other	8.5

### 3.5 Prevalence and Treatment of Acute Respiratory Infections

In response to the survey, 30.0% of all children (n = 200) under 60 months had experienced an acute respiratory infection in the two weeks before the survey. The ARI lasted an average of  $5.5 \pm 4.8$  days. When asked to report the number of episodes of ARI's/coughing experienced by the child in the last 12 months for children 12 – 60 months, mothers reported an average of  $3.2 \pm 5.5$  episodes of ARI's.

Table 12 shows the associated signs and symptoms the child experienced during his or her ARI that occurred in the two weeks preceding the survey. Of the 60 children with ARI's, 85% experienced coughing and 70% had had a fever. 40% of the children had had chest indrawing.

Table 12. Signs and Symptoms Experienced by the Child During His/Her ARI	
Sign/Symptom	Percentage of Responses (%) (n = 60)
Doesn't know	0.0
Fast/Difficulty breathing	11.7
Chest indrawing	40.0
Fever	70.0
Cough	85.0
Loss of appetite	10.0
Phlegm	5.0
Vomiting	6.7
Other	8.3

Table 13 shows from whom treatment was sought during the child's ARI. Two thirds of women sought treatment from either a private medical clinic or private pharmacy and only 21.7% sought treatment from the public health facilities. Reasons for not seeking treatment included that the baby was too young (4 mothers), as well as 6 'other' responses.

Table 13. Treatment Sought for ARI	
Treatment	Percentage of Children (%) (n = 60)
Public Medical	21.7
Private Medical	66.7
Non-Medical (e.g. traditional healer)	0.0
Total Seeking Treatment	83.3
No Advice/Treatment Sought	16.7

Table 14 shows the responses of mothers demonstrating their ability to recognize when they should seek medical treatment based on associated signs and symptoms of an ARI. Mothers primarily identified coughing (63.0%) and fever (61.5%) as important signs for which to seek treatment, followed by chest indrawing (38.0 %) and fast or difficulty breathing (19.5%).

Table 14. Recognition of Sign/Symptoms of ARI Needing Treatment	
Sign/Symptom	Percentage of Responses (%) (n = 200)
Doesn't know	13.0
Fast/Difficulty breathing	19.5
Chest indrawing	38.0
Fever	61.5
Cough	63.0
Loss of appetite	11.0
Phlegm	4.5
Quiet Baby	3.5
Vomiting	3.5
Other	5.5

### 3.6 Prevalence and Treatment of Worms

In response to the survey, 4.5% of all children (n = 200) under 60 months had worms or had had worms in the two weeks preceding the survey, while 12.9% of children aged 12-59 months (n = 116) had experienced an episode of worms in the preceding 12 months. When surveyed, only 14.0% of mother's could recall having been given mebendazole (or other worm medications) prophylactically during her pregnancy. Additionally, only 30.2% of children aged 12-59 months had been given mebendazole prophylactically.

Of the children who had recently had worms (previous two weeks), 2 of the mothers had done nothing to get rid of the child's worms. One mother had attempted self-removal from the child's rectum, one had tried a home-remedy and 7 had given the child anti-worm medication. Table 15 shows the treatment sought for the worms by the mother.

Table 15. Treatment Sought for Worms	
Treatment	Percentage of Children (%) (n = 9)
Public Medical	22.2
Private Medical	55.6
Non-Medical (e.g. traditional healer)	0.0
Total Seeking Treatment	77.8
No Advice/Treatment Sought	22.2

Table 16 shows the responses of mothers demonstrating their ability to recognize when they should seek medical treatment based on associated signs and symptoms of a child with worms. Mothers primarily identified an enlarged abdomen (54.0%) and weight loss (43.5%) as important signs for which to seek treatment, however, 25.5% could not identify any signs or symptoms of worms.

Table 16. Recognition of Sign/Symptoms of Worms Needing Treatment	
Sign/Symptom	Percentage of Responses (%) (n = 200)
Doesn't Know	25.5
Weight Loss	43.5
Fever	10.0
Dehydration	2.0

Loss of appetite	9.0
Presence of worms in anus/stool	9.0
Enlarged Abdomen	54.0
Increased Appetite	1.0
Stomach Ache	11.5
Other	19.5

### 3.7 Nutritional Intake

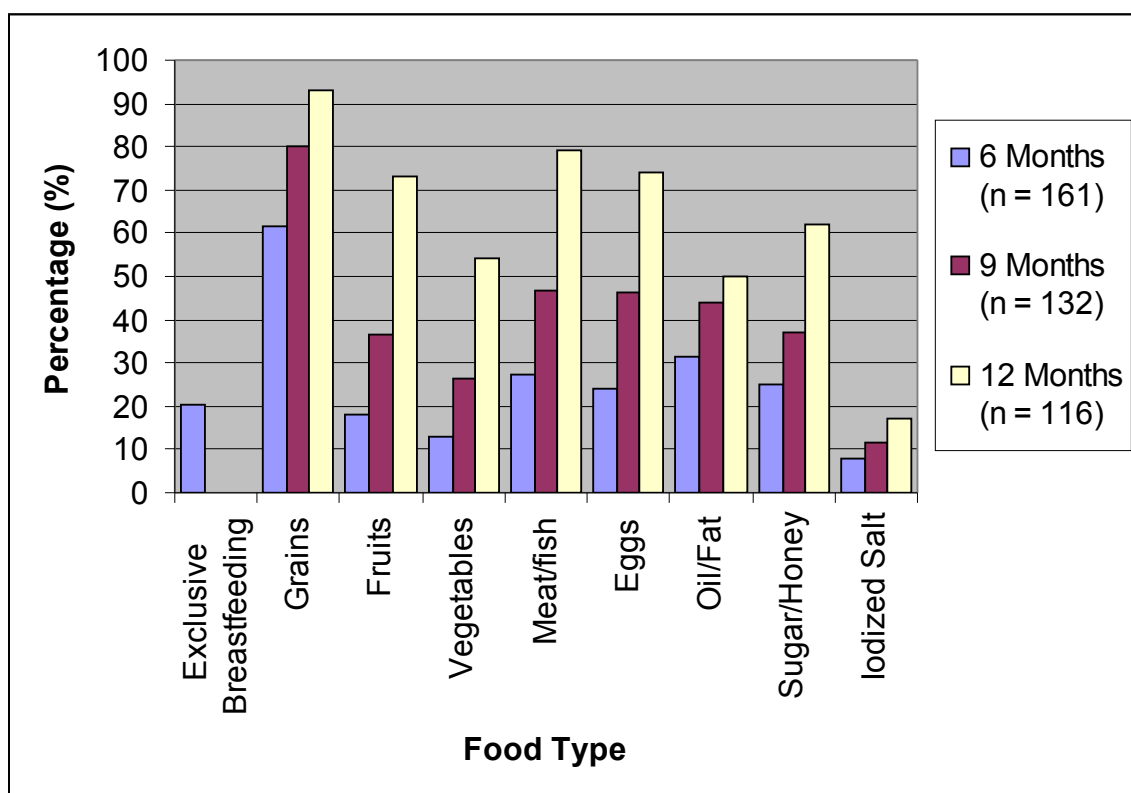
Table 17 shows how soon after delivery the mother could recall breastfeeding for the first time. Almost all mothers (98.5 %) breastfed their infants, however, only 18.5 % breastfed within the first hour following birth.

Table 17. Breastfeeding	
Breastfeeding	Percentage of Responses (%) (n = 200)
Never Breastfed	1.5
Ever Breastfed	98.5
Within 1 hour of delivery	18.5
1-8 hours following delivery	11.5
8-24 hours following delivery	23
Greater than 24 hours following delivery	43
Does not remember when first breastfed	2.5

When asked at what age should food be introduced to infants, 4.5 % of mothers reported that it should be at less than 4 months of age, 58.5 % reported between 4 and 6 months of age, 27.0 % reported that food should be introduced at 7 months or later and 10% of mothers did not know when food should be introduced to their child. Mothers were asked what types of foods should be added and 78.0% reported rice porridge, 32.0 % described foods rich in iron and 22.0 % described foods rich in vitamin A. 5.5 % said that they did not know what types of foods should be introduced.

When asked what vitamin helps to prevent night blindness, only 10% knew that it was vitamin A. When further questioned as to what foods help prevent night blindness, 87.5 % said that they did not know, 8.5 % reported green vegetables, 0.5 % reported orange/yellow vegetables, 6.0 % reported meat/fish and 2.0 % reported egg yolks.

Figure 1 shows the when foods were introduced to the child throughout his or her infancy. By 6 months, only 20.5 % of children continued to be exclusively breastfed. By 12 months of age, only 54.3 % of children had received vegetables and 73.3 % had received fruits.



**Figure 1.** Food introduction to children in Kep, Cambodia. The proportion of children who had received a given food type by either 6, 9, or 12 months of age as reported by the child's mother.

### 3.8 Nutritional Status of Child and Growth Monitoring

Anthropometric data of the child of the mother interviewed were collected to evaluate their nutritional status. Children who fell two standard deviations or more below the median using the International Reference Population defined by the U.S. National Center for Health Statistics were considered malnourished. Table 18 shows the percentage of children who were malnourished (< 3<sup>rd</sup> percentile) based on their measured length/stature-for-age, weight-for-age and weight-for-length for children 0-59 months as well as head circumference for children 0-36 months.

Table 18. Nutritional Status of Children in Kep	
Measurement	Percentage of Responses (%) (n = 200)
Length for age	58.5
Weight for age	43.0
Weight for length	14.5
Head Circumference (n = 177)	23.7

The yellow growth monitoring card of each child was examined to calculate the number of times each child had been measured by staff member of a health care facility. Over half (51 %) of cards were unavailable (either lost or the mother never had one) for evaluation, 35.0 % were blank, 10 % showed the child had been measured once, 2.0 % had been measured twice and 2.0 % had been measured 3 times.

## 4.0 DISCUSSION

### 4.1 Demographics

It has been well documented that education is a key determinant of socioeconomic status. One's level of education has a major influence on one's actions and approach to daily living such that the higher the level of education of an individual or population, the better the health status of that individual or population. In the context of the current study, the more schooling a given mother has might suggest she is more knowledgeable about and takes a more active approach to her child's health. Given that 25.0 % of mothers surveyed have never attended school, another 21.5 % have attended school but remain illiterate and only 5.0 % have actually attended secondary school, it is no wonder that the health care situation in Kep remains abysmal.

Families in rural Cambodia rely primarily on subsistence farming as their form of employment and food source. This is reflected in the responses to the survey in Kep whereby 50.0 % of the mothers consider their form of employment to be farming, while another 40.0 % consider themselves to be unemployed. As this survey was conducted at the height of the rainy season, when agricultural productivity is at its peak, it does not reflect seasonal variation that may exist in employment. The results of this may therefore be an over estimate of those who are actually full time farmers.

### 4.2 Fertility and Prenatal Care

Fertility preferences and contraceptive use were determined to assess the unmet need for family planning in Kep. Fertility preferences were assessed by asking mothers whether or not they desired to have a child within the next two years. Only 22.5 % of women wanted to have a baby in the next two years, included in that number is the 11.5 % of all interviewees who knew they were pregnant at the time of the interview. Given these numbers and the result that almost three-quarters (73.5 %) of women were currently not using any form of contraception, there is clearly an unmet need for family planning in Kep. Whether this is a lack of knowledge about contraceptive methods available or an access to contraceptives issue limiting the delivery of these services remains to be determined.

The prenatal care a mother receives can be critical for the welfare and survival of her child. These visits provide opportunity to offer iron and folate supplementation, tetanus toxoid vaccination, as well to provide blood pressure testing for the mother. Not only do prenatal visits aid in identifying problems throughout the pregnancy, but they present a critical opportunity to provide the mother with information about how to properly care for her child's health. In Cambodia, upon visiting a hospital or health centre for prenatal care, a mother will receive a White Maternal Health Book where all prenatal care information is recorded. Only 11.0 % of mothers could show their Maternal Health Book on request at the interview while another 26.5 % claim to have lost it. Half of mothers claimed to have received prenatal care, however, since 62.5 % claimed to have never had a Maternal Health Book, this suggests that a large were not carried out at a health centre or hospital. The source and quality of care given is therefore unknown. Interventions need to include encouraging mothers to regularly attend and record prenatal sessions. In addition, the role of the midwife must be explored in her ability to encourage seeking care at the health centres.

Neonatal tetanus is one of the leading causes of mortality in Cambodia<sup>12</sup>. It is an often fatal condition that usually develops in the first or second week of life in infants born under unhygienic conditions to inadequately vaccinated mothers. When a pregnant mother receives a tetanus vaccination, immunity is conferred to the fetus through transplacental transfer of maternal antibodies. The CDC recommends that a previously unvaccinated pregnant woman whose child may be born without sterile technique, as is the case with almost all deliveries in Kep, should receive two doses of tetanus vaccine 4-8 weeks apart prior to delivery, preferably within the last two trimesters<sup>13</sup>. In addition, the CDC recommends that women who have not previously had a complete vaccination series be given a three-dose vaccination series<sup>14</sup>.

In Cambodia, all pregnant women are to receive a pink tetanus vaccination card upon vaccination from a health centre or hospital. These cards were used as indicators of maternal tetanus toxoid vaccination in this study. Alarming, almost half (49 %) of mothers had never received any tetanus injections and did not have cards, 32 % said that they had lost their cards but claimed to have received at least one injection. 5.0 % of mothers could demonstrate by their cards that they had received one tetanus injection and 14 % of mothers could demonstrate that they had received two or more injections. Given the unhygienic conditions of many deliveries in Cambodia, including the use of unsterilized instruments

<sup>12</sup> Cambodia Environmental Health Profile, World Health Organization, 2004.

<sup>13</sup> Centres for Disease Control, 2005.

<sup>14</sup> Ibid.

to cut the umbilical cord, it is critical that these low vaccination rates need to be addressed. From the survey, it is clear that a lack of education about tetanus toxoid that may be part of the culprit in the low vaccination rates. Only 21.5 % of mothers knew that the tetanus vaccination was for the benefit of both the mother and the newborn and at least one-third of the women did not know that the vaccination consisted of a series of injections.

### 4.3 Vaccination Coverage

Immunization of children against 6 vaccine-preventable diseases is critical for reducing infant mortality and morbidity in developing nations as well as in assisting in the eradication of some of these illnesses. Currently, vaccinations are to be provided free of charge by health centre staff for tuberculosis, diphtheria, whooping cough, tetanus, polio, measles, and more recently, Hepatitis B. Children are considered fully vaccinated when they have received the following: 1 dose against tuberculosis, 3 doses each of DPT and polio vaccines and a measles vaccination. All of these should be completed by the age of 12 months.

Vaccination coverage of all children was assessed in two ways. First, mothers were asked whether their child had ever been vaccinated and second, the vaccination dates were copied directly from the yellow vaccination cards onto the questionnaire. Most mothers (80.5 %) reported that their child had ever had any vaccination but only 51.5 % were able to produce a yellow vaccination card to verify that their child had actually received any vaccinations. This is much lower than the reported national data on Cambodia put forth by the World Health Organization who reported that in 2004, at 95 % of infants had received a BCG vaccination, 85% had received all three DPT vaccinations and 86% had received their third polio vaccination.<sup>15</sup> Discrepancies in these numbers may lie in the fact that Kep is a rural area where access to health facilities may be more difficult compared with the rest of the country or perhaps there is incorrect reporting by either local authorities to the Ministry of Health in Cambodia. Finally, there may be poor recall of the mother's as to whether their child has been immunized.

The results in Table 4 show that there exist serious inadequacies in the current vaccination program offered by the health centres and hospital. Vaccination coverage is appallingly low and there is little in place to ameliorate the system. Currently, to obtain a vaccination, a family member may take the child to the local health centre to obtain a vaccine, which may take over two hours by foot to get there or health centre staff make monthly rounds to each village to give vaccinations. Problems with this system are multifaceted. First, access to the health centres is extremely limited both in terms of adequate transportation to get to the health centre and the number of hours per day that it is served by staff. Second, when health centre staff come to the villages, they do so at a somewhat irregular schedule. Also, if the mother is busy on that given day or is either not at home or not at the local market where the vaccination clinic may be taking place, her child will unlikely be immunized. There are no patient records kept by health centre staff as to which households have an infant needing immunizations. The only records kept are the number of vaccinations administered by the health centre staff in a given month. Additionally, these records are not reflective of the claims made by villagers for vaccination coverage. Finally, there is very limited knowledge about what vaccines are needed for the child and this becomes problematic, especially for vaccinations such as measles, which occur later in infancy and have the lowest rates of administration (21.6 %). For the mothers whose infants have never been immunized, several myths prevail that propagate the failure of the immunization system. These include fear about their child getting a fever with the vaccine, fear of injections, misconceptions that their infant is too young to go to the hospital or that they simply did not know that they needed to have any immunizations.

### 4.4 Prevalence and Treatment of Diarrhea

One of the major causes of death in infants and children in developing countries is dehydration from diarrhea. Because this is easily treatable through oral rehydration therapy, health education programs should place management of diarrhea near the top of the priority list. In the two weeks preceding the survey, 14.5 % of children under 60 months of mothers surveyed had experienced diarrhea. Interpretation of this result may be slightly biased because it was obtained through maternal recall and it does not reflect the potential seasonal variation that may exist in prevalence of diarrhea.

Maternal knowledge and actions about what to do when their child is experiencing diarrhea is poor. Only 13.8 % of mothers reported giving their child more breast milk during the diarrhea and 24.1 % of mothers reported giving their child more fluids other than breast milk. The Cambodian Demographic and Health Survey reported in 2000 that the national percentage of rural mothers who knew about oral rehydration salt packets (ORS) was 48 %.<sup>16</sup> It also reported

<sup>15</sup> Cambodia reported immunization coverage, World Health Organization, 2006.

<sup>16</sup> CHDS, 2000.

that three quarters of children surveyed were treated with some type of oral rehydration therapy including a solution prepared from an ORS packet, recommended home fluids, or rice water. Only 12 % of all children with diarrhea did not receive any treatment at all. Unfortunately, the picture in Kep is much worse and it is imperative that the discrepancies between the national averages and the responses from this survey in Kep need to be addressed by local health officials. In Kep, 31 % of children received no treatment for their diarrhea. Not a single mother surveyed reported that they had used either ORS or a sugar-salt solution for their child's diarrhea and only 10 % had used either rice soup or another home fluid (e.g. tea). A mere 24 % of the children were taken to a public health facility for advice or treatment and 28 % sought no treatment or advice from either the public, private or non-medical sectors.

Follow-up questions from these results were asked in the survey to tease out whether the poor actions taken were a reflection of a lack of knowledge about what to do should a child experience diarrhea or whether something was impairing their ability to seek or provide treatment for their child. Twenty-two percent of mothers knew that they should give their child more fluids when he or she had diarrhea. Only 1.5 % knew about ORS and 47 % reported that they should take their child to a health facility. Mothers' ability to recognize clinical signs that warrant taking their child to a health facility is limited. Fever was recognized as such a sign by 82 % of mothers, vomiting by 37 % of mothers, blood in the stool by 35 % of mothers and mucus in the diarrhea by 5.0 % of mothers. From these results, it is clear that education outreach activities need to focus on education about what to do when a child has diarrhea and how to recognize important signs and symptoms needing prompt medical treatment.

#### 4.5 Prevalence and Treatment of Acute Respiratory Infections

Acute respiratory infections (ARI's) are a major cause of death in infancy and childhood in developing nations. They are often treatable through a course of antibiotics from which the countless deaths can be prevented. In this survey, the prevalence and treatment of ARI's were determined by asking mothers whether their child had experienced an episode of coughing in the two weeks preceding the survey. Further questions were asked with regards to what other symptoms the child had experienced, what treatment was sought and what signs and symptoms would prompt seeking treatment at a medical facility. The answers to the questions are limited by recall bias, subjective perception of what constitutes an ARI by the mother and the prevalence of ARI's did not take into account the variability between seasons.

Thirty percent of children surveyed had reportedly experienced an ARI in the two weeks preceding the survey. This is 50 % higher than the reported national average of 20 % reported in the CDHS in 2000.<sup>17</sup> Of those surveyed with an ARI, 70 % had had a concomitant fever and 40 % had had chest indrawing. The majority of mother's sought treatment (83 %) for their child's treatment but two-thirds of women sought in through private medical care.

As with diarrhea, the mother's knowledge of what signs and symptoms warrant seeking medical care was limited. Mothers primarily identified coughing (63 %) and fever (62 %) as important signs for which to seek treatment, followed by chest indrawing (38 %) and fast or difficulty breathing (20 %). Education must focus on early identification of signs and symptoms for which a mother should obtain treatment for her child's infection.

#### 4.6 Prevalence and Treatment of Worms

Helminth infestations have been a major cause of malnutrition, gastrointestinal problems as well as other health problems including anemia and slowed cognitive development in developing countries, especially Cambodia. The highest infection rates present in school children aged 5-15 and include roundworm, whipworm and hookworm. Treatment of worms by anthelmintic drugs is usually curative but reinfection must be prevented through improved sanitation and hygiene<sup>18</sup>.

Until recently, approximately 70 % of Cambodia's children were infected with intestinal worms but that number has been dramatically reduced since the induction of the global anthelmintic control target established by the World Health Assembly in 2001<sup>19</sup>. Anti-parasitic medications are readily available in Cambodian schools and health facilities. The recent targeting of de-worming children combined with the expected lower incidence rate in the younger aged group of the children surveyed in this study is reflected in the low prevalence of worms in Kep. Only 4.5 % of all children in the two weeks preceding the survey and 12.9% of children 12-59 months in the 12 months preceding the survey reported having had worms. When surveyed, 14.0% of mother's could recall having been given mebendazole (or other worm

<sup>17</sup> Ibid.

<sup>18</sup> Sinoun et. al., 2003.

<sup>19</sup> Bulletin of the World Health Organization, 2004.



medications) prophylactically during her pregnancy. Additionally, 30 % of children aged 12-59 months had been given mebendazole prophylactically. These results may be biased due to poor recall. They may also not reflect the entire picture in Kep with regards to worms as the target age of the survey is the population in which worm infestations may be lowest. Additionally, 26 % of mothers could not name a single sign or symptom that their child may have if they have worms. Only a small proportion could identify an enlarged abdomen (54 %) and weight loss (43 %) as key indicators of intestinal worms. Thus, there may be an underreporting of the actual prevalence of intestinal worm infections. Most of the mothers had sought treatment for their child with anti-worm medication through either the public (22 %) or the private (56 %) health system.

Efforts in this area should continue to maintain and build upon the school program as well as educating parents to take prophylactic worm medication and respond promptly to obvious infections in their child.

#### 4.7 Nutritional Intake

For the newborn baby, breast milk serves as the most desirable and complete source of nutrition. It contains the needed nutrients for the first six months of life. In addition, breast milk affords the baby with important immunologic protection through colostrum. Colostrum is a pre-milk substance produced by the mother in the first two to three days following delivery. It has important immune factors that are conferred through the mother's milk to the baby to help prevent infection. Breastfeeding in Kep, like the rest of Cambodia, is widespread with 98 % of the infants of mothers surveyed ever breastfed.<sup>20</sup> Unfortunately, very few (18 %) mothers initiate breastfeeding immediately after birth (within one hour) and as many as 43 % wait at least 24 hours prior to initiation of breast feeding.

Exclusive breastfeeding is the preferred mode of nutritional intake during the first six months of life. This should provide the infant with adequate calories and a superior balance of both macro and micro nutrients compared to often nutritionally inferior supplementary foods. Exclusive breastfeeding will promote breast milk production and provide prevents potential exposure to pathogens which may cause infection from drinking contaminated water. Bottle feeding should be discouraged because of the risk of increased infection from poorly sterilized nipples. Finally, without exclusive breastfeeding, postpartum amenorrhea can be shortened which can increase the risk of pregnancy. Given that only 20% of women breast fed exclusively in the first six months of their baby's life, the importance of exclusive breastfeeding needs to be emphasized. This can be done through education programs at health centres and with midwives. Information about potential contamination from drinking water and the inadequacy of the nutrient value in sugar water for infants needs to be disseminated and stressed.

#### 4.8 Nutritional Status and Growth Monitoring

Malnutrition in Kep was staggering. Well over half of children in the study were short in stature as defined by the U.S. National Centre for Health Statistics. . Over 40% were underweight for their age and 14.5% were in less than the 3<sup>rd</sup> percentile for weight-for length. Weight-for-age is traditionally the most common marker of the nutritional status of children in developing countries. Children who fall 2 standard deviations below the mean are considered to be moderately to severely undernourished. Available daily caloric supply to the children appears to be inadequate given the substantial number of children who were underweight. In addition, the quality of food sources was poor due to poor food security and availability<sup>21</sup>.

Weight-for-age scores have been used to assess death rates among children world wide. According to Potera (2004), low weight-for-age has been shown to be the leading risk factor in child deaths accounting for 52% of child deaths world wide<sup>22</sup>. When the common diseases affecting these populations were broken down by individual disease, undernutrition was found to be responsible for 60.7% of deaths from diarrhea, 57.3% deaths from malaria, 52.3% death\s from pneumonia, and 44.8% deaths from measles. Thus, according to Potera's paper, undernutrition augments how susceptible a child is to illness and increases the probability that the illness will be severe<sup>23</sup>. Given this, it is no doubt that Kep should be considered as a priority for national and regional health and nutrition programs.

Growth monitoring are measures that should be carried out regularly for every child. Growth monitoring, as an example of active participation in a child's health, has been shown to be an effective strategy to reduce the likelihood of

<sup>20</sup> CDHS, 2000.

<sup>21</sup> Tan, 2006.

<sup>22</sup> Potera, 2004.

<sup>23</sup> *ibid*.

undernutrition in children.<sup>24</sup> In Cambodia, the reverse side of the yellow vaccination card has a growth monitoring chart that is given to each mother when the baby is either delivered at a health facility or when the baby is given his/her first vaccination. In more than half of mothers interviewed, cards were unavailable and with mothers that did have cards, 35 % (of the total number of mothers surveyed) had blank cards. Only 15% of mothers could demonstrate having ever had their child measured. This number highlights the need for improved growth monitoring in Kep, especially in young infants where prevention of stunted growth is most critical.

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<sup>24</sup> Sakisaka et. al., 2006.

## 5.0 RECOMMENDATIONS

The following recommendations are being made based on the results of this study and qualitative observations made throughout the course of data collection while in the field. The recommendations have been broken down by specific topic in addition to a discussion of “general recommendations” for the health care programs in Kep.

### General Recommendations:

- 1) Increase number of physician visits to villages for infant immunizations and make visits regularly scheduled.
- 2) Promote and implement training workshops for midwives, traditional healers and local health centre and hospital staff for management of common childhood illnesses so that education outreach activities can be expanded.
- 3) Develop free or low cost “Maternal-child education classes” at local schools or health centres for all women of child bearing age. Training for instructors can be done through the Centre for International Health and promotion of classes can be through midwives and village elders.
- 4) Train midwives and health centre staff to teach new mothers appropriate pre-, peri- and post-natal care at each contact with mother.

### Specific Recommendations:

#### Fertility and Prenatal Care:

- 1) Determination whether low rates of family planning are due to poor access to services versus a lack of knowledge about family planning options.
- 2) Increase the antenatal care offered by health centres and midwives by increasing outreach activities. Health centre staff can go into villages with the white Maternal Health Book and encourage its use, *regularly*, by all mothers of child bearing age.

#### Immunizations:

- 1) Further assessment and investigations need to be carried out to determine why such vast discrepancies exist between the WHO reporting of vaccination coverage and local vaccination coverage in Kep.
- 2) The vaccination delivery program in Kep needs to be reorganized to provide more accessible vaccination services. Specifically:
  - a. Outreach workers need to be in the villages to give vaccinations according to a more regular schedule.
  - b. Follow up care for missed vaccinations needs to be done by health centre staff
  - c. Recording of vaccinations given must be more thorough by health centre staff.
  - d. At each visit to a health centre, hospital or outreach clinic, parents should be encouraged to bring their vaccination card for all children under the age of five so that ‘catch-up’ vaccines can be received for children previously missed. Health centre staff should ask for this regularly.
  - e. Vitamin A capsules should be dispensed *and recorded* with each immunization visit.

#### Prevalence and treatment of diarrheal diseases and ARI's:

- 1) Education outreach activities by health centres and CIH staff need to be carried out which emphasize the following:
  - a. Hand washing technique and its importance
  - b. Proper meal preparation to avoid contamination with feces
  - c. Appropriate measures for cleaning up an infants feces to avoid contamination
  - d. Important signs and symptoms that must be recognized in a child with an ARI or diarrhea warranting medical care.

#### Prevalence and treatment of worms:

- 1) Continue to educate students through the school system and provide regular worm medication to school aged children.
- 2) Carry worm medication on ALL health centre outreach activities to be given out for those in need.
- 3) Teach parents to look for worms in their child's stool and other signs and symptoms of a worm infection. Emphasis must also be placed on the importance of prompt treatment.

Nutritional intake:

- 1) Mothers need to be taught by midwives and health centre staff about the importance of early breast feeding and exclusive breast feeding.
- 2) Education must focus on appropriate introduction of solids for infants and disseminating information about what comprises a balanced diet.

Nutritional status and growth monitoring:

- 1) Mothers should be encouraged to bring their yellow card to every hospital or health centre visit so that staff may fill it out and help to monitor the child's growth. This will provide an opportunity for further discussions about how to get a child back on the correct growth curve if he or she is malnourished.
- 2) Health centre staff must be more rigorous in filling out cards during immunization visits to villages.

## **6.0 CONCLUSIONS**

Maternal child health-related KAP is poor. Little is known about prevention and management of common childhood illnesses. Knowledge about appropriate infant and child nutrition as well as antenatal care is insufficient. Most of the child morbidity and mortality is totally preventable through maternal education programs. Urgent intervention is thus necessary to implement local educational programs for women of child-bearing age. Education must include topics such as immunizations, sanitation, and treatment of diarrhea, acute respiratory infections and worms as well as infant and child nutrition programs.

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## 9.0 APPENDIX A

### CONSENT FORM READ TO MOTHER

Name of Mother: \_\_\_\_\_ IDNUM: \_\_\_\_\_

My name is Natasha Saunders, and I am representing the Centre for International Health at the University of Toronto, Canada and the Ministry of Health in Cambodia. I would like to ask you some questions about the health of your child so the project staff can learn about the health of children in your village and in Kep. Some of the questions will be about what you do when your child is sick and some questions will be asked to learn what you know about some health problems of children. We are asking these questions so that we can know what to teach mothers in order to improve the health of children in your village. We are asking these questions to mothers with children under two years of age. You have been randomly selected among all mothers who live in the project area and have children less than two years old. Every effort will be made to keep the information you provide me confidential. Reports will not mention any individuals. The information will be used by project staff to plan health programs. The interview will take about 40 minutes. The survey is voluntary and you may choose not to participate. If you decide not to participate, this decision will not affect the health care you would otherwise receive. If you do participate, you can refuse to answer any of the questions and you can end the interview at any time. You will not receive direct compensation for your participation in this study.

If you have questions about the study or would like to know about the results, you can contact Dr. Roy McGroarty at the Centre for International Health office in Kep.

Do I have your permission to ask you some questions?

Yes ☐

No ☐

I, \_\_\_\_\_ (Name of translator) certify that I have translated this information into Khmer for the mother and she understands all aspects of what this letter entails. I certify that the information provided to me by the mother with regards to consent is true.

\_\_\_\_\_  
Signature of Translator

\_\_\_\_\_  
Date

## 9.1 APPENDIX B

### MCH KAP SURVEY, KEP, CAMBODIA By Natasha Saunders

HOUSEHOLD: IDNUM: VILLAGE: COMMUNE:

Interview date: Interviewer name:

#### Identification:

1. Mother's name: Mother's age (years): Child's Sex: M F
2. Youngest child's name: Youngest child's age (months): Youngest child's birth date:
3. Distance of household to Health Centre: < 2 km ☐ 2-5 km ☐ > 5 km ☐
4. Number of children in family:

#### Mother's Education/Occupation:

5. What was the highest educational level you attained?
  - a) none..... ☐
  - b) primary does not read..... ☐
  - c) primary reads..... ☐
  - d) secondary ..... ☐
  - e) post-secondary ..... ☐
6. Do you do any "income generating work"? (Multiple answers possible; record all answers)
  - a) nothing..... ☐
  - b) making handicrafts (such as mats, baskets, scarves)..... ☐
  - c) paid agricultural labor/harvesting ..... ☐
  - d) street vendors (including agricultural products, food, etc.) ..... ☐
  - e) shop keeper..... ☐
  - f) salaried worker..... ☐
  - g) other (specify)..... ☐
7. Who takes care of baby when you are away from home? (Multiple answers possible; record all answers)
  - a) mother takes child with her..... ☐
  - b) husband..... ☐
  - c) older children..... ☐
  - d) grandmother ..... ☐
  - e) other relative (specify)..... ☐
  - f) neighbours/friends..... ☐
  - g) shared care arrangement ..... ☐
  - h) other (specify)..... ☐

#### Breastfeeding/Nutrition:

8. Have you ever breast-fed your baby?
  - a) yes..... ☐
  - b) no..... ☐ -> go to 14
9. Are you currently breastfeeding your baby?
  - a) yes..... ☐
  - b) no..... ☐
10. a. How long did you exclusively breast feed without liquid supplements?
- b. When did you introduce solids?
- c. What solids did you start with?
  - a) Rice cereal ..... ☐
  - b) Fruits..... ☐
  - c) Vegetables ..... ☐
  - d) Meat/chicken/fish..... ☐
11. After the delivery, when did you breast-feed your baby for the first time?
  - a) during the first hour after delivery ..... ☐
  - b) from 1 to 8 hours after delivery ..... ☐
  - c) more than 8 hours after delivery ..... ☐
  - d) do not remember ..... ☐
12. a. Are you giving your baby supplemental water?
  - a) yes..... ☐ If YES, when was it introduced?
  - b) no..... ☐



- c) doesn't know ..... ☐
- b. Are you giving your baby canned milk, or powdered milk?
- a) yes..... ☐ , If YES, when was it introduced?
- b) no..... ☐
- c) doesn't know ..... ☐
- c. Are you giving your baby semisolid foods such as rice soup or chewed rice?
- a) yes..... ☐ , If YES, when was it introduced?
- b) no..... ☐
- c) doesn't know ..... ☐
- d. Are you giving your baby fruits?
- a) yes..... ☐ , If YES, when was it introduced?
- b) no..... ☐
- c) doesn't know ..... ☐
- e. Are you giving your baby pumpkin, papaya, mango, or jackfruit?
- a) yes..... ☐ , If YES, when was it introduced?
- b) no..... ☐
- c) doesn't know ..... ☐
- f. Are you giving your baby dark green leafy vegetables, such as morning glory, stak bas, p'tee, or spy k'mao?
- a) yes..... ☐ , If YES, when was it introduced?
- b) no..... ☐
- c) doesn't know ..... ☐
- g. Are you giving your baby meat or fish?
- a) yes..... ☐ , If YES, when was it introduced?
- b) no..... ☐
- c) doesn't know ..... ☐
- h. Are you giving your baby eggs?
- a) yes..... ☐ , If YES, when was it introduced?
- b) no..... ☐
- c) doesn't know ..... ☐
- i. Are you adding honey or sugar to your baby's meals?
- a) yes..... ☐ , If YES, when was it introduced?
- b) no..... ☐
- c) doesn't know ..... ☐
- j. Are you adding fat or oil to your baby's meals?
- a) yes..... ☐ , If YES, when was it introduced?
- b) no..... ☐
- c) doesn't know ..... ☐
- k. Are you adding iodized salt to your baby's meals?
- a) yes..... ☐ , If YES, when was it introduced?
- b) no..... ☐
- c) doesn't know ..... ☐
13. When should a mother start adding foods to breastfeeding?
- a) start adding earlier than 4 months of age ..... ☐
- b) start adding between 4-6 months of age ..... ☐
- c) start adding later than 6 months of age ..... ☐
- d) doesn't know ..... ☐
14. What should those additional foods to breastfeeding be & when should they be introduced? (Multiple answers possible; record all answers)
- a) doesn't know ..... ☐
- b) add oil to food..... ☐
- c) give food rich in Vitamin A (such as jackfruit, papaya, mango, pumpkin, green leafy vegetables).... ☐
- d) give food rich in iron (such as meat, fish, dark green leafy vegetables)..... ☐
- e) other (specify) ..... ☐
15. Which vitamin helps you prevent "night blindness"?
- a) vitamin A..... ☐
- b) doesn't know or other..... ☐
16. Which foods contain vitamin A to prevent "night blindness"? (Multiple answers possible; record all)
- a) doesn't know or other ..... ☐
- b) green leafy vegetables..... ☐

- c) orange or yellow fruits..... ☐
- d) meat/fish ..... ☐
- e) breast milk..... ☐
- f) egg yolks..... ☐

**Diarrheal Diseases:**

17. How many bowel motions does your baby normally have each day?
18. How many times has your child had an episode of diarrhea in the past 12 months?
19. Has your baby had diarrhea during the last two weeks?
- a) yes..... ☐ If yes, how long did it last?
  - b) no..... ☐ ---> go to 28
  - c) doesn't know ..... ☐ ---> go to 28
20. During your baby's diarrhea did you breast-feed: (read choices 1-4 to the mother)
- a) more than usual? ..... ☐
  - b) same as usual?..... ☐
  - c) less than usual? ..... ☐
  - d) stopped completely?..... ☐
  - e) child not breastfed ..... ☐
21. During your baby's diarrhea, did you provide your baby with fluids other than breast-milk:  
(read choices 1-4 to the mother)
- a) more than usual?..... ☐
  - b) same as usual?..... ☐
  - c) less than usual?..... ☐
  - d) stopped completely?..... ☐
  - e) child not receiving fluids other than breastmilk...☐
22. During your baby's diarrhea, did you continue to provide your baby with solid/semisolid foods:  
(read choices 1-4 to the mother)
- a) more than usual? ..... ☐
  - b) same as usual?..... ☐
  - c) less than usual?.....☐
  - d) stopped completely?.....☐
  - e) child not receiving foods other than breastmilk..... ☐
23. When your child had diarrhea, what treatments, if any, did you use? (Multiple answers possible; record all)
- a) nothing ..... ☐
  - b) ORS packet ..... ☐
  - c) sugar-salt solution ..... ☐
  - d) rice soup (borbor) ..... ☐
  - e) home available fluids (such as coconut water or tea from leaves or roots)..... ☐
  - f) anti-diarrheal medicine or antibiotics..... ☐
  - g) other (specify)..... ☐
24. When your baby had diarrhea, did you seek advice or treatment for the diarrhea?
- a) yes..... ☐
  - b) no..... ☐ ---> go to 28 If no, why not?
25. From whom did you seek advice or treatment for the diarrhea of your baby? (Multiple answers possible; record all answers)
- a) hospital.....☐
  - b) health center .....☐
  - c) private clinic/doctor.....☐
  - d) pharmacy/drug seller.....☐
  - e) village health volunteer.....☐
  - f) traditional healer.....☐
  - g) traditional birth attendant.....☐
  - h) relatives & friends.....☐
  - i) other (specify).....☐
26. What signs/symptoms would cause you to seek advice or treatment for your baby's diarrhea? (Multiple answers possible; record all answers)
- a) doesn't know .....☐
  - b) vomiting.....☐
  - c) fever.....☐
  - d) dehydration (dry mouth, thirsty, sunken eyes, decreased urine output).....☐
  - e) diarrhea of prolonged duration (at least 14 days) .....☐
  - f) blood in stool ..... ☐
  - g) loss of appetite.....☐
  - h) weakness redness..... ☐
  - i) other (specify)..... ☐
27. What are important actions you should take if your baby has diarrhea? (Multiple answers possible; record all answers)
- a) doesn't know.....☐

- b) initiate fluids rapidly.....[ ]
- c) give the child more to drink than usual .....[ ]
- d) give the child smaller more frequent feeds .....[ ]
- e) proper mixing and administration of ORS.....[ ]
- f) take child to the hospital/health center.....[ ]
- g) feed more after diarrhea episode so that child can re-gain weight .....[ ]
- h) withhold fluids.....[ ]
- i) withhold foods.....[ ]
- j) other (specify) ..... [ ]

28. What are important actions a mother should take when a child is recovering from diarrhea?

(Multiple answers possible; record all answers)

- a) doesn't know ..... [ ]
- b) give the child smaller more frequent feeds..... [ ]
- c) more foods than usual ..... [ ]
- d) give foods with high caloric content..... [ ]
- e) other (specify)..... [ ]

#### Respiratory Illness:

29. How many times has your baby had an episode of coughing in the past 12 months?

30. Has your baby been ill with a cough or difficulty breathing in the last two weeks?

- a) yes..... [ ]
- b) no..... [ ] --> go to 38

31. What symptoms did your child experience when he/she was ill? (Multiple answers possible; record all)

- a) doesn't know .....[ ]
- b) fast or difficult breathing.....[ ]
- c) chest indrawing .....[ ]
- d) fever.....[ ]
- d) cough.....[ ]
- e) loss of appetite.....[ ]
- f) other (specify).....[ ]

32. How long did it last?

33. Did you seek treatment when your baby was ill with these respiratory problems?

- a) yes..... [ ]
- b) no..... [ ] --> go to 38. If no, why not?

34. From whom did you seek treatment for your baby? (Multiple answers possible; record all answers)

- a) hospital.....[ ]
- b) health center .....[ ]
- c) private clinic/doctor.....[ ]
- d) pharmacy/drug seller.....[ ]
- e) village health volunteer.....[ ]
- f) traditional healer.....[ ]
- g) traditional birth attendant.....[ ]
- h) relatives & friends.....[ ]
- i) other (specify).....[ ]

35. What are the signs/symptoms of respiratory infection that would cause you to take your baby to a health facility? (Multiple answers possible; record all answers)

- e) doesn't know .....[ ]
- f) fast or difficult breathing.....[ ]
- g) chest indrawing .....[ ]
- h) fever.....[ ]
- d) cough.....[ ]
- e) loss of appetite.....[ ]
- f) other (specify).....[ ]

#### Immunizations:

36. Has your baby ever received any immunizations?

- a) yes ..... [ ] If yes, where did he/she get his/her vaccination?
- b) no ..... [ ] If no, why not?
- c) doesn't know..... [ ]

40. At what age should your baby receive the following vaccines (specify in months)?

BCG.....	DPT 1 <sup>st</sup> .....
OPV 1 <sup>st</sup> .....	DPT 2 <sup>nd</sup> .....
OPV 2 <sup>nd</sup> .....	DPT 3 <sup>rd</sup> .....
OPV 3 <sup>rd</sup> .....	Measles.....
Doesn't know .....[ ]	

37. Do you have a yellow immunization/growth monitoring card for your baby?

- a) yes ..... [ ] (must see card)
- b) lost it ..... [ ] ----> go to 35
- c) never had one ..... [ ] ----> go to 35

38. Look at the yellow immunization/growth monitoring card and record the dates of all the immunizations in the space below (dd/mm/yy)

BCG ...../...../.....	DPT 1 <sup>st</sup> ...../...../.....
OPV 1 <sup>st</sup> ...../...../.....	DPT 2 <sup>nd</sup> ...../...../.....
OPV 2 <sup>nd</sup> ...../...../.....	DPT 3 <sup>rd</sup> ...../...../.....
OPV 3 <sup>rd</sup> ...../...../.....	Measles ...../...../.....

**Growth Monitoring:**

39. Look at the yellow immunization/growth monitoring card of the child, and record the number of times the child has been weighed and measured.

**Maternal Care:**

40. When you were pregnant with your baby did you visit any health site (hospital, health centre) for prenatal care?

- a) yes .....[ ]
- b) no.....[ ]

41. What is the main reason why pregnant women need to be vaccinated with tetanus toxoid vaccine?

- a) to protect both mother/newborn against tetanus.....[ ]
- b) to protect only the woman against tetanus.....[ ]
- c) to protect only the newborn against tetanus .....[ ]
- d) doesn't know or other..... [ ]

42. How many tetanus toxoid injections does a pregnant woman need to protect the newborn infant from tetanus?

- a) one.....[ ]
- b) two.....[ ]
- c) more than two..... [ ]
- d) none.....[ ]
- e) doesn't know..... [ ]

43. Do you have a maternal health book?

- a) yes ..... [ ] (must see card)
- b) lost it..... [ ] ---- > go to 51
- c) no.....[ ] ---- > go to 51

44. Look at the maternal health book and record whether the mother ever made any antenatal visit?

- a) one.....[ ]
- b) two.....[ ]
- c) three or more....[ ]

46. Do you have a pink tetanus toxoid card?

- a) yes ..... [ ] (must see card)
- b) lost it.....[ ]
- c) no .....[ ]

If the mother has no white or pink card, go to 53.

47. Look at either the white maternal health card or the pink tetanus toxoid card and record the number of tetanus toxoid vaccinations in the space below:

- a) one.....[ ]
- b) two or more...[ ]
- c) none.....[ ]

48. Are you pregnant now?

- a) yes..... [ ] ---- > go to 57
- b) no..... [ ]
- c) doesn't know ..... [ ]

49. Do you want to have another child in the next two years?

- a) yes.....[ ] ---- > go to 57
- b) no.....[ ]
- c) doesn't know .....[ ]

50. Are you or your husband currently using any method to avoid or postpone getting pregnant?

- a) yes..... [ ]
- b) no ..... [ ] ---> go to 57

51. What is the main method you or your husband are using now to avoid or postpone getting pregnant?  
(Multiple answers possible; record all answers)

- a) tubal ligation .....[]
- b) vasectomy .....[]
- c) Norplant .....[]
- d) injections .....[]
- e) pill .....[]
- f) IUD.....[]
- g) condom .....[]
- h) lactational amenorrhea method (exclusive breast-feeding).....[]
- i) rhythm .....[]
- j) abstinence.....[]
- k) coitus interruptus/withdrawal......[]
- l) other (specify) .....[]

52. When you were pregnant with your baby was the amount of food you ate:

- a) more than usual?.....[]
- b) same as usual?.....[]
- c) less than usual? .....[]
- d) doesn't know.....[]

**Worms:**

53. Has the mother been given Mebandazole for worms in the 2<sup>nd</sup> trimester (see maternal health book)?

- a) yes.....[]
- b) no.....[]
- c) doesn't know.....[]

54. If baby is older than 12 months, has he/she been given Mebandazole for worms?

- a) yes.....[]
- b) no.....[]
- c) doesn't know.....[]

55. How many times has your child had an episode of worms?

56. Has your baby had worms during the last two weeks?

- a) yes..... []
- b) no..... []
- c) doesn't know ..... []

57. During your baby's worms did you breast-feed: (read choices 1-4 to the mother)

- a) more than usual? ..... []
- b) same as usual?..... []
- c) less than usual? ..... []
- d) stopped completely?..... []
- e) child not breastfed ..... []

58. During your baby's worms, did you provide your baby with fluids other than breast-milk:

(read choices 1-4 to the mother)

- a) more than usual?..... []
- b) same as usual?..... []
- c) less than usual?..... []
- d) stopped completely?..... []
- e) child not receiving fluids other than breastmilk....[]

59. During your baby's worms, did you continue to provide your baby with solid/semisolid foods:

(read choices 1-4 to the mother)

- a) more than usual? ..... []
- b) same as usual?..... []
- c) less than usual?.....[]
- d) stopped completely?.....[]
- e) child not receiving foods other than breastmilk..... []

60. When your child had worms, what treatments, if any, did you use? (Multiple answers possible; record all)

- a) nothing ..... []
- b) removed from rectum by self or family member..... []
- c) home remedy (such as coconut water or tea from leaves or roots)..... []
- d) anti-worm medicine.....[]
- e) other (specify)..... []

61. When your baby had worms, did you seek advice or treatment for the worms?

- a) yes..... []
- b) no..... [] --->go to 68 If no, why not?

62. From whom did you seek advice or treatment for the worms of your baby? (Multiple answers possible; record all answers)

- |                                     |  |
|-------------------------------------|--|
| a) hospital.....[ ]                 | f) traditional healer.....[ ]          |
| b) health center .....[ ]           | g) traditional birth attendant.....[ ] |
| c) private clinic/doctor.....[ ]    | h) relatives & friends.....[ ]         |
| d) pharmacy/drug seller.....[ ]     | i) other (specify).....[ ]             |
| e) village health volunteer.....[ ] |  |

63. What signs/symptoms would cause you to seek advice or treatment for your baby's worms? (Multiple answers possible; record all answers)

- |  |
|--|
| a) doesn't know .....[ ]   |
| b) weight loss.....[ ]   |
| c) fever.....[ ]   |
| d) dehydration (dry mouth, thirsty, sunken eyes, decreased urine output).....[ ] |
| e) worms of prolonged duration .....[ ]  |
| f) enlarged abdomen.....[ ]  |
| g) loss of appetite.....[ ]  |
| h) presence of worms in anus.....[ ]   |
| i) other (specify).....[ ]   |

Thank the mother for her participation in the survey.

\*\*\*\*\* **END OF QUESTIONNAIRE** \*\*\*\*\*